

CLAIMS:

1. A method for operating an internal combustion engine with electromechanical valves, the method comprising:
5 operating at least a cylinder in a multi-stroke mode; and
 varying the number of strokes of said cylinder as an operating condition of at least an electromechanical valve varies.
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2. The method of Claim 1 wherein said operating condition is a temperature of a valve actuator coupled to at least one of said electromechanically actuated valves.
- 15 3. The method of Claim 2 wherein said valve actuator is comprised of at least an armature, a coil, and a core.
4. The method of Claim 1 wherein said operating condition of said electromechanically actuated valve is
20 an impedance of a valve actuator coupled to at least one of said electromechanical actuated valves.
5. The method of Claim 1 wherein said operating condition of said electromechanically actuated valve is a
25 temperature of at least one of said electromechanically actuated valves.

6. A method for determining when to combust a mixture in a cylinder of an internal combustion engine with electromechanically actuated valves, the method comprising:

- 5 determining an operating condition of at least one electromechanical actuated valve;
 operating at least an intake valve of a cylinder, inducting at least an air amount into said cylinder of said engine, mixing said air amount and an
10 injected fuel amount producing a air-fuel mixture;
 combusting said air-fuel mixture; and
 adjusting a number of cylinder strokes after said combustion of said air-fuel mixture to delay a valve opening in said cylinder as said operating condition
15 varies.

7. The method of Claim 6 wherein said operating condition is a temperature of a valve actuator coupled to at least one of said electromechanically actuated valves.
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8. The method of Claim 7 wherein said operating condition is a temperature of at least one of said electromechanically actuated valves.

25 9. The method of Claim 6 wherein said operating condition is an amount of power consumed by a valve actuator coupled to at least one of said electromechanically valves.

30 10. The method of Claim 6 wherein said valve is an intake valve.

11. The method of Claim 6 wherein said valve is an exhaust valve.

12. A method for determining when to combust a mixture in a cylinder of an internal combustion engine with electromechanically actuated valves, the method

5 comprising:

determining an operating condition of at least one of said electromechanically actuated valves;

determining a number of cylinder strokes to delay combustion after opening an intake valve in a
10 cylinder based on said operating condition;

opening at least an intake valve of said cylinder inducting at least an air amount into said cylinder, mixing said air amount and an injected fuel amount producing a air-fuel mixture; and

15 delaying combustion of said air-fuel mixture said number of cylinder strokes after said intake valve opening.

13. The method of Claim 12 wherein said operating
20 condition is a temperature of a valve actuator coupled to at least one of said electromechanically actuated valves.

14. A method for determining when to combust a mixture in a cylinder of an internal combustion engine with electromechanically actuated valves, the method comprising:

- 5 determining an operating condition of at least one of said electromechanically actuated valves;
- determining an operating condition of said internal combustion engine;
- opening at least an intake valve of said
- 10 cylinder, inducting at least an air amount into said cylinder, mixing said air amount and an injected fuel amount producing a air-fuel mixture; and
- combusting said air-fuel mixture; and
- adjusting a number of cylinder strokes after said
- 15 combustion of said air-fuel mixture to delay a valve opening in said cylinder as said engine operating conditions and said valve operating conditions vary.

15. The method of Claim 14 wherein said operating
20 condition of said electromechanically actuated valve is a temperature of a valve actuator coupled to at least one of said electromechanically actuated valves.

16. The method of Claim 15 wherein said valve actuator
25 is comprised of at least an armature, a coil, and a core.

17. The method of Claim 14 wherein said operating
condition of said electromechanically actuated valve is
an impedance of a valve actuator coupled to at least one
30 of said electromechanical actuated valves.

18. The method of Claim 14 wherein said operating condition of said electromechanically actuated valve is a temperature of at least one of said electromechanically actuated valves.

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19. The method of Claim 14 wherein said engine operating condition is engine speed.

20. The method of Claim 14 wherein said engine operating
10 condition is engine load.

21. The method of Claim 14 wherein said engine operating condition is a temperature of said engine.

15 22. The method of Claim 14 wherein said valve opening is an exhaust valve opening.

23. The method of Claim 14 wherein said valve opening is an intake valve opening.

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24. A method for determining when to combust mixtures in an internal combustion engine having at least a first and a second group of cylinders, at least one group of said first and second groups having electromechanically
5 actuated valves, the method comprising:
determining at least an operating condition of at least a electromechanical valve;
selecting at least one cylinder of said first cylinder group based on said electromechanical valve
10 operating condition and said engine operating condition;
opening at least an intake valve of said selected cylinder in said first cylinder group, inducting at least an air amount into said cylinder, mixing said air amount and an injected fuel amount producing a air-
15 fuel mixture;
combusting said air-fuel mixture; and
adjusting a number of cylinder strokes, different than a number of cylinder strokes of said second group, after said combustion in said selected
20 cylinder to delay a valve opening as said electromechanical valve operating conditions vary.

25. The method of Claim 24 wherein said valve opening is an exhaust valve opening.

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26. The method of Claim 24 wherein said valve opening is an intake valve opening.

27. A computer readable storage medium having stored data representing instructions executable by a computer to control an internal combustion engine of a vehicle, said storage medium comprising:

- 5 instructions for operating at least a cylinder in a multi-stroke mode;
- adjusting the number of strokes of said cylinder based at least on an operating condition of at least an electromechanical valve.

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